DOCUMENT RESUME

ED 096 186 SO 007 567

AUTHOR	Kurfman, Dana G.; Phillips, Ina M.
TITLE	Using Simulation to Involve Students: Instructor's Guide and Participant's Manual. Teaching Procedures for the New Social Studies.
INSTITUTION	Association of American Geographers, Washington, D.C.; High School Geography Project, Boulder, Colo.
SPONS AGENCY	National Science Foundation, Washington, D.C.
PUB DATE	1 Feb 70
NOTE	83p.; Out of Print; For related documents see SO 007 568 and SO 007 799; The games are available from the Macmillan Co., 866 Third Ave. N.Y., N.Y. 10022
EDRS PRICE	MF-$0.75 HC Not Available from EDRS. PLUS POSTAGE
DESCRIPTORS	Activity Learning; Affective Objectives; Cognitive Objectives; Content Analysis; Educational Games; *Effective Teaching; *Geography Instruction; Interaction Process Analysis; Methods Courses; *Observational Learning; Role Models; Social Studies; *Stimulation; *Teaching Techniques
IDENTIFIERS	*High School Geography Project

ABSTRACT

Using simulations developed by the High School Geography Project and films recording the use of the simulations, teachers learn to: (1) use simulation exercises in class; (2) provide a classroom atmosphere conducive to free interaction and expression among students; (3) analyze simulation in terms of problems considered, alternative choices, factors influencing a choice, and conflicting roles; (4) identify cognitive and affective objectives implicit in simulations; and (5) discuss advantages and disadvantages of simulation as a teaching strategy. The five hours required for the training processes include participating in a simulation, analyzing simulation through reading and discussion, viewing two simulations to clarify the role of the teacher in the class, and viewing a third simulation to apply the learned analysis techniques. The instructor's guide gives procedures for organizing the events of the training program and cues for discussion and analysis. The participant's manual gives directions about the events with questions for discussion. Films mentioned in the document are available through the catalogs of the Mountain Plains Educational Media Council and the Indiana University Audio-visual Center, under the title High School Geography: New Insights. (JH)

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TEACHING PROCEDURES FOR THE
NEW SOCIAL STUDIES

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USING SIMULATION TO INVOLVE STUDENTS

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Dana G. Kurfman
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INSTRUCTOR'S GUIDE
and
PARTICIPANT'S MANUAL

Produced by
High School Geography Project
Dana Kurfman, Director
Sponsored by
The Association of American Geographers
Supported by
The National Science Foundation

Provisional Edition: February 1, 1970
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Printed in U.S.A.

USING SIMULATION TO INVOLVE STUDENTS

Instructor's Guide

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ACKNOWLEDGMENTS

Many persons deserve thanks for their contributions to the High School Geography Project teacher education materials. Special mention should be made of Dana G. Kurfman, Robert W. Richburg, Ronald J. B. Carswell, Robert M. Cason, Ina M. Phillips, and Susan J. Beasley, who were responsible for the completion of the original drafts.

Major editing responsibility was assumed by Louise Ott, Senior Editor.

Production and cartography were the responsibility of Terrill Barr.

Acknowledgment is given to The Macmillan Company for use of excerpts and adaptations from the Geography in an Urban Age course.

The Project is indebted to the Associated Colleges of the Midwest Video Tape Project for providing the video tape, "The Classroom As It Is." Special mention is made of Kay Ingleman and Philip Cognetta, Sheridan Junior High School, Minneapolis, Minnesota; and Sister M. Hermana, Regina High School, Minneapolis, Minnesota, for their cooperation in teaching the activities which appear on the video tape.

Rationale for Using Simulation to Involve Students

One of the major goals of social studies education is helping students make more intelligent decisions about matters that concern them. The suggested approach to this goal for high school classrooms is the consideration of personal or social problems that have immediate importance to students. Advocates of this position seek student involvement by opening up controversial issues to analysis and investigation.

Although this "problems" approach has been forcefully advocated, it has been little practiced in social studies classrooms. One of the reasons for the lack of use may be the difficulty of fitting problem solving situations into a school curriculum organized in terms of subject matter disciplines. Social studies teachers and the materials they use, as well as courses offered, continue to reflect a strong subject matter orientation. Often, one of the consequences is a lack of student involvement in the learning process.

Simulation strategies are proposed as a means of involving students in realistic problems which also are relevant to one or more social studies subjects. Most social studies subjects deal with significant problems where human choices are required. For example, history is concerned with choices which have influenced

subsequent events; economics with resource allocation decisions; political science with public policy problems and geography with locational choices.

Simulations are an excellent device for involving students in such problems. As conceived here, the essential characteristic of simulations is student involvement in making choices within small groups. The problems with which the groups work can be as easily derived from subject matter disciplines as from the contemporary interests of students.

Student motivation is an important result of involvement in making choices. Student involvement is attained by creating situations where students disagree about the choice to be made. When students are asked to agree on a choice about which there is natural disagreement, working in small groups to reach their decisions has motivational effects.

Even within the framework of group decision-making, simulations have many variations. For example, some use role playing but others do not. Another major type of simulation is based on principles of gaming. The major motivation in "game" simulations is competition. These kinds of simulations have a legitimate place in social

studies classes but will not be considered in this kit.

On the assumption that teachers, as well as high school students, learn by doing, this kit provides a number of opportunities to participate in simulation exercises. In the first part of the kit, participants form management teams and make factory location choices. They also analyze a video tape showing three high school classes working with simulations. Participation and analysis activities in this kit can form the basis for teaching of simulations by participants in their own classrooms. One of the major requirements for effective teaching of simulation activities is teacher behavior that allows free student expression while encouraging the development of thinking and group process skills. In addition to improving their capabilities in teaching simulation activities, participants also should become more familiar with the advantages and disadvantages of using such activities in high school classrooms.

Overview of the Kit

The overview chart on the next page is included to give you a summary of the kit's purposes, procedures and materials. Five hours or 250 minutes are needed to complete the kit. The parts of the kit need not be completed in one meeting of the group but may be combined or divided to fit your available blocks of time.

OVERVIEW CHART OF TEACHING TIMES, PURPOSES, PROCEDURES AND MATERIALS

Parts	Purpose	Procedures	Materials
I Participating in a Simulation 75 minutes	Introduce participants to a simulation by involving them in an exercise.	Participants form groups and assume roles to decide on the best location for a metal fabricating plant.	Role descriptions containing various tables and value information.
II Analyzing a Simulation 30 minutes (plus 20 minutes of outside reading)	Familiarize participants with the elements and procedures involved in a simulation exercise.	Through a reading and class discussion, the participants gain an understanding of simulation characteristics.	"Analyzing a Simulation" reading.
III Clarifying the Role of the Teacher 65 minutes	Clarify the role of the teacher in a simulation exercise.	Participants observe two high school classes doing the factory location simulation. Discussion focuses on the role of the teacher in a simulation.	Two video tapes of the factory location simulation. Written summaries of the video tape.
IV Applying a Simulation Model 80 minutes	Give participants experience in applying their knowledge of simulation to a new exercise.	Participants analyze an exercise that varies from the factory location simulation.	Video tape of the "Portsville" simulation activity. Synopsis of the complete activity. Written summary of the video tape.

During the first meeting with your class or in-service group, you may wish to refer the participants to "General Information" and "Introduction to Using Simulation to Involve Students," beginning on page 1 of the Participant's Manual. Participants can read the sections on their own time. However, you may want to reinforce the participants' understanding about the role they are to assume as they become involved in the simulation exercises to follow in this kit. The participants are not to pretend that they are high school students. Although the simulation exercises were designed originally for high school students, they have been adapted to fit more mature participants and have been used successfully with a number of adult groups.

Participant Objectives

After completing this kit, participants should be more likely to and better able to:

1. Use simulation exercises in their classrooms.
2. Provide a classroom atmosphere in which students are free to interact and to express a variety of reasons for their opinions.
3. Analyze simulation exercises in terms of the problem considered, alternative choices, factors influencing a choice, and conflicting roles.

4. Identify the cognitive and affective objectives implicit in simulation exercises.

5. Discuss the advantages and disadvantages of simulation as a teaching strategy.

Planning Suggestions and Materials Check List

You will need to read the relevant sections in the Participant's Manual, as well as the suggestions included in this Guide for each part of the kit. Part I is a role-playing exercise. Part II is a standard class discussion based on a reading in the Participant's Manual. In addition to readings in the Participant's Manual, Parts III and IV require the use of video tape playback equipment as well as a video tape which you should have received from the ACM Video Tape Project. This kit requires the use of the first thirty-five to forty minutes of the sixty minute video tape, "The Classroom As It Is," Volume SS 812. You probably will want to preview the tape before you actually use it in Parts III and IV. You will need to be familiar with the tape in order to be able to stop it at certain places, designated later in this Guide, so that your participants will have time to note their impressions.

PART I: PARTICIPATING IN A SIMULATION

This part of the kit utilizes role-playing to

demonstrate that the location of a manufacturing company is the result of a complex decision. In this simulation exercise, the participants form management teams and are responsible for making the decisions necessary to locate the Metfab Company. Metfab, a metal fabrication company, makes large containers for companies producing agricultural and industrial chemicals. The participants use maps, tables, and written information to help them arrive at their decisions. (This simulation exercise is adapted from "Locating the Metfab Company," a classroom activity in the High School Geography Project's unit, Manufacturing and Agriculture, published by The Macmillan Company.)

The class is divided into groups of five participants and each group is given the same materials. However, because of varying personal and group reactions to the information presented, different groups are expected to make different locational choices. Because the groups arrive at different choices, student interest is stimulated. Also, the fact that several different locations may prove to be almost equally favorable is highlighted.

Background information and roles extend from page 4 to page 18 in the Participant's Manual. Although participants do not read all roles, you will need to. Also, you probably should read "Analyzing a Simulation,"

Part II of the Participant's Manual. Some of the points made in Part II of this Guide may help to increase your understanding of the Metfab simulation. The estimated teaching time for this part is seventy-five minutes, which includes time for participants to read the background information and their roles. You will note that the simulation exercise has been divided into three sections: Introduction (15 minutes), Group Work (30 minutes), and Summary (30 minutes). An explanation of each section follows.

Introduction

You can introduce participants to the location-decision exercise by indicating that most manufacturers consider good locational decisions very important in determining the success of their business. Therefore, they try to make the most rational decisions that they can, based on current and expected conditions. Tell the participants they will assume roles and operate as a management team to consider some of the factors that could influence the location of one type of manufacturing plant. Then their team will make the location decision for the imaginary factory.

These introductory remarks should be followed by your asking the participants to form groups of five and

to read the introduction to the simulation in the Manual beginning on page 4 and continuing to the beginning of the president's role on page 8. Each person in a management team should then select a different role based on the limited information provided up to this point in the Manual. These roles are designed so that all participants will complete their work at approximately the same time; however, the different roles place somewhat different demands on the participants.

If the class does not divide evenly by five, you may have four participants on a management team and omit one of the roles. Since the president is instructed to chair the meeting of the management team and help the group to arrive at their decision, his role is the only one that may not be omitted.

You may wish to point out that you will serve as research consultant. This will give you the opportunity to be in contact with each of the groups, and also allows the participants to have access to you. Therefore, you should be thoroughly familiar with all the materials and each of the roles.

Although the factory location simulation was devised for high school students, it has been tried successfully with adult groups. Therefore, the participants should make no effort to assume the roles as they think

high school students would. In assuming their role, participants may utilize any knowledge they have about the problem. However, no additional research is to be done.

You should also point out that the data contained in the roles are not necessarily valid. Inaccuracies in the data or hypothetical data do not affect the validity of the concepts involved in making factory location decisions. Nor do inaccuracies in the data affect the development of the abilities and attitudes that are major objectives of the exercise.

Group Work

Each participant should be instructed to study his role as described in the Participant's Manual for about ten minutes. He should analyze his data and decide which city or cities he feels would make the best location. In addition, he should decide how to defend his viewpoint. You may want to instruct each participant to use a piece of paper to list the several cities he favors most as locations, as well as the positive attributes of each city. Each participant should have an opportunity, as a part of the management team, to defend his choices. Under the leadership of the president, the members of the team should then debate the relative merits of their

preferences in order to reach the best location decision for the company. This should take approximately twenty more minutes.

Summary

When the management teams have made their decisions, the class should be brought back together for discussion. You will want to find out which city was chosen by each group. In addition, allow some time for the groups to defend their various location choices and encourage them to bring out the reasons for the group decisions. However, discussion about the actual decision should be kept brief. Any of the places mentioned could be considered satisfactory.

Then a discussion should explore some of the learning outcomes of the simulation. The beginning of the reading in the Participant's Manual, "Analyzing a Simulation," briefly comments on simulation objectives and might be useful to you at this time. These objectives are increased understanding, improved thinking and group process skills, and positive attitudes. As participants mention various learning outcomes, your questioning should bring out their meaning and value as social studies objectives. You should help participants clarify what worthwhile objectives they think may be achieved

by educational simulations. You might begin by asking this question: What do you think you learned from the factory location simulation?

One type of response is likely to focus on the cognitive or knowledge outcomes of the exercise. For example, participants are likely to mention that the factory location problem is more complex than they thought at first. Many factors, such as transportation costs, availability of raw materials, potential market, and the climate of the area, can influence the location decision. Participants also may note that knowledge of these factors is a significant learning outcome, too.

Another cognitive learning is the awareness that an emphasis on different factors, as well as on different values, can result in several equally supportable solutions to the same problem. For instance, one group may have felt that an economic factor, such as accessibility to a large potential market, was of top priority in making the location decision. Another group may have felt that the availability of an adequate supply of labor was a more important factor to consider. Still another group might have considered non-economic factors, such as air pollution, to be of ultimate importance in influencing their decision.

Participants in this factory location simulation

may also note that they learned something about group decision-making processes, that is, how individuals in groups change their views in interaction with others. Other possibilities include learning more about the kind of reasoning required to examine several alternative solutions in terms of different criteria such as materials costs, markets and labor productivity. You might want to ask participants what group process and decision-making learnings might ensue when simulation exercises are used a number of times during the school year.

Participants also might mention another kind of learning in the attitudinal or affective domain. Simulations have considerable promise of success in developing positive attitudes toward many subjects, including school. Participants may become convinced they like group decision-making exercises and that high school students will too.

PART II: ANALYZING A SIMULATION

This part of the kit uses a reading to supplement the direct experience with a simulation exercise provided in Part I of the kit. The reading discusses the objectives and major elements of the type of educational simulation demonstrated by the factory location exercise. The reading provides a basis for analyzing the simulation

exercise in which the participants were involved.

The reading, "Analyzing a Simulation," extends from page 18 to page 29 in the Participant's Manual and should be assigned to be read outside of class prior to beginning the class discussion. About thirty minutes are needed for the class discussion that follows the reading. If outside assignments are not practical, fifteen or twenty minutes will have to be provided in class.

Before beginning discussion on the characteristics of a simulation, you may wish to entertain comments and questions from participants about simulation objectives. However, extensive repetition of the discussion about objectives is not necessary. In order to discuss the characteristics of a simulation, ask participants to illustrate the characteristics of a simulation by referring to the Metfab simulation. The questions raised in the reading are repeated below with some possible answers.

1. How would you formulate the problem or issue you were asked to decide upon? Did the developer of this simulation simplify the choices? If so, how did he do it?

This simulation exercise is based upon the problem of selecting the best location for a manufacturing company's production facilities. The possibilities were simplified by restricting the choices to eight cities

or metropolitan areas: New York, Cincinnati, Atlanta, Houston, Los Angeles, Pittsburgh, Detroit, and New Orleans.

2. In the factory location simulation exercise with which you have worked, what factors were selected as influences on the location decision? Which of these factors would you classify as objective and which would you classify as subjective?

Market factors, such as total existing market, anticipated share of the market, and potential future market, were one set of objective factors selected for consideration. Others were cost factors such as raw materials, labor costs, taxes, interest rates, and shipping charges to buyers. Some of the subjective factors were the location of family, relatives and climatic considerations. Another subjective element, of course, is the relative importance different people might attach to any of the objective factors.

3. For the factory location simulation exercise you have completed, identify some of the factors assigned to each role other than the president's.

The sales manager was given an interest in the total available market and finished product shipping costs for each city. The production manager was assigned a concern for raw materials, shipping costs and labor

productivity. The personnel manager had to consider labor costs and availability. The treasurer was assigned such factors as corporate taxes, available bank deposits and interest rates.

PART III: CLARIFYING THE ROLE OF THE TEACHER

This part of the kit is designed to give participants an opportunity to analyze the role of a teacher in a simulation exercise, as well as some of the problems the teacher is likely to encounter in teaching a simulation. Participants will watch a video tape of two different high school classes working on the factory location simulation that they have completed in Part I. Participants then will discuss how the teacher's role changes from the "Introduction" stage of a simulation to the "Group Work" and "Summary" stages. They will also be able to compare the different teaching styles of two teachers.

The materials needed are Parts I and II of the video tape, "The Classroom As It is," Volume SS 812, obtained from the ACM Video Tape Project. The first part of the tape is about thirteen minutes long and the second part about ten minutes long. A summary of each of these videotaped segments is provided beginning on page 33 of the Participant's Manual. In addition, the Participant's

Manual, beginning on page 33, provides suggestions for viewing the video tape and concludes with a series of questions for class discussion.

Participants should read carefully, before viewing the tape, the suggestions and the questions provided on pages 31 to 34 of their Participant's Manual. As you go over this section of the Participant's Manual, you will note that the video tape is to be stopped for a few moments after the "Introduction" phase, the "Group Work" phase, and the "Summary" phase so that the participants will have time to write down aspects of teacher and student behavior that they have observed and will consider during class discussion. A "fade" marks the end of each phase. Approximately thirty minutes will be needed for the viewing of the video tape.

In the general class discussion that follows the viewing of the video tape, you or the participants may wish to bring up a number of topics that are not noted in the questions provided in the Participant's Manual. To help you in the consideration of the questions, they are repeated here with some suggested answers.

1. What similarities and differences did you note in the way the two teachers handled the introduction, group work, and summary phases of the simulation? During which phase did you note the greatest difference between the two teachers.

Both teachers seem to introduce the materials in a similar way. They both play an explanatory-descriptive role intended to lay a foundation for the group work to follow. Neither teacher has any direct interaction with students. Probably the greatest difference in the approach used by the two teachers is evident in the group work phase of the simulation exercise. Both teachers are involved in a great deal of interaction with students in small groups and as individuals. The major difference between the two teachers might be in the greater directiveness of the first teacher.

The major difference between the two teachers during the summary phase appears to be the tendency of the first teacher to assume a role of intermediary between students.

2. What differences, if any, did you note in the way roles were assigned to the students?

The second teacher provided for the individual student to select his own role, while the first teacher apparently assigned the roles to students.

3. What differences, if any, did you note in the way the two teachers ask questions? Also, in the way they handle student questions or comments.

There is some evidence to suggest that the second teacher tends to ask questions so that students will

clarify their positions. This same teacher consciously pulls away from making any judgments about the responses and comments of the students. There is also some evidence to suggest that the first teacher uses questions to help students focus on one aspect or another of their work. This teacher seems more willing to play the role of the devil's advocate, thereby challenging the positions taken by some of the students.

4. Did either teacher attempt to summarize the learnings of the simulation exercise? Do you think it is desirable to do so? Why?

At the conclusion of the summary phase, one teacher did raise the question of what the students had learned. This practice is generally considered a desirable means of reinforcing student learnings.

5. Identify one of the teachers and indicate some things you would have done differently during the three phases of the simulation.

The responses to this question will differ from participant to participant. You should encourage participants to visualize themselves as teachers of this simulation exercise.

6. Which of the three phases probably would be easiest and which probably most difficult for you to teach? Why?

Again, this will be answered in terms of the views of each participant. This question, as well as question 5, attempts to help participants visualize themselves as teachers of simulation exercises.

7. What appear to be some of the major advantages and disadvantages of simulation exercises?

Those who support the use of simulations tend to focus on the positive attitudinal responses of students. Additional affective outcomes are discussed in other parts of this kit. Those who favor simulations also say that a more lasting understanding of principles is achieved and that students learn thinking and group process skills. Some of the disadvantages of simulations are the usually greater amount of time required for the teaching of the generalizations built into the simulation. To teach these generalizations directly is usually quicker although students often do not retain the generalizations as long. A second possible disadvantage is the apparent disorganization of the classroom which could lead a teacher into difficulties with his administrators. Finally, the great amount of teacher preparation necessary may be considered a disadvantage.

PART IV: APPLYING A SIMULATION MODEL

In this application, participants view and analyze

a video tape of a high school class working out a simulation exercise that is different in several ways from the simulation exercise participants used in Part I of this kit. The analysis that follows the viewing of the video tape focuses on three topics: first, the instructional process in this classroom; second, the objectives being sought in teaching this simulation; and third, the characteristics of a simulation as they were described in Part II.

The materials needed for this part of the kit include Part III of the video tape provided by the ACM Video Tape Project. This segment of the video tape, about sixteen minutes in length, focuses on a teacher teaching a simulation activity called "Portsville." In addition, pages 40 to 43 are an introduction to the video tape, followed by a snyopsis of the "Portsville" activity from pages 43 to 46, and a summary of the video tape from pages 46 to 49, all in the Participant's Manual. ("Portsville" is an activity in the HSGP unit, Geography of Cities, published by The Macmillan Company.)

Before participants view Part III of the video tape, they should read the introduction from page 40 to 43 in their Participant's Manual which provides a basis for the topics to be discussed afterwards. In this orientation to the video tape, participants are told that the

tape is divided into "Introduction," "Group Work," and "Summary" phases. As you did with the video tape in the previous part of this kit, you should stop the tape for a few minutes at the end of each phase so that your participants can write down their impressions.

Participants should also read the synopsis of the "Portsville" activity before they view the video tape; otherwise, the brief scenes on the tape may be confusing. Also, the video tape summary may be useful to participants before they view the tape, in providing a review of what is shown on the video tape.

You can expect that you and your group may have comments and questions related to the video tape other than those listed in the Participant's Manual. However, major attention should be given to the questions provided in order to bring out the indicated points about the instructional process, the objectives, and the characteristics of a simulation. The questions that are provided in the Participant's Manual are repeated here with some suggested answers.

1. How would you describe the instructional process in this particular classroom with respect to: a) the role of a teacher, especially in questioning and interacting with students, b) student participation, c) the attitude of students toward the teacher and to one another?

On some occasions the teacher uses questioning to bring out specific points he wishes to establish. At other times he uses his questions to probe for students' reasons. He appears to be more willing than many teachers to continue to question a student until the student's ideas are brought out as fully as possible. At times, when the teacher is involved primarily in explanatory-descriptive remarks, he continues to use questions to keep the students focused on what he is saying. Participation by the students would appear to be very high. Boredom or a tendency to stray away from the work at hand is not very evident. The students seem relaxed with the teacher and with one another.

2. What do students seem to be learning in this simulation with respect to: a) concepts and/or generalizations, b) intellectual abilities or skills, c) attitudes about school experiences and, d) attitudes about themselves and fellow students?

Because there is less evidence than desirable to answer this question, participants will be forced to make inferences from particularly limited data. With respect to generalizations, students seem to understand how different kinds of land use are related to one another, particularly with reference to the accessibility of residential areas to commercial and public land

usage. Students also make decisions and support them, as well as challenge the decisions of fellow students. The students seem to feel positive about the experiences they have in this class, as well as about their own contributions and those of their fellow students.

3. In what ways is "Portsville" similar to and different from the factory location simulation with respect to: a) the problem requiring decision, b) the use of clearly designated choices, c) the factors that seem to influence student decisions, d) the use of roles, and e) the way that information is provided for students?

This "Portsville" simulation seems to require the solution of a series of subtle problems. These are problems that require a decision about the most desirable location of different types of land use in relation to other types of land use. This contrasts with the single problem emphasized in the factory location simulation. Another major difference is that the "Portsville" simulation clearly has no designated alternatives which students can choose. Students are required to generate their own choice possibilities as they proceed through the simulation. The factors influencing student decisions are different in that the generalizations operating in making factory location decisions are

different from those in making land use decisions. Another difference is that the "Portsville" simulation does not use roles; consequently, information is provided for students by means of a narrative.

TEACHING PROCEDURES FOR THE NEW SOCIAL STUDIES

USING SIMULATION TO INVOLVE STUDENTS

by

Dana G. Kurfman
Ina M. Phillips

PARTICIPANT'S MANUAL

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Sponsored by
The Association of American Geographers

Supported by
The National Science Foundation

Provisional Edition: February 1, 1970

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Printed in U.S.A.

USING SIMULATION TO INVOLVE STUDENTS

Participant's Manual

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General Information

With the publication by The Macmillan Company of the High School Geography Project's year-long course, Geography in an Urban Age, the Project has turned its attention to the development of teacher education materials. The kits of HSGP teacher education materials reflect the Project's emphasis on teaching strategies that encourage student inquiry and involvement. Like many of the HSGP units, the teaching procedures demonstrated in the teacher education kits are usable in other social studies courses, as well as geography.

Three HSGP teacher education kits have been prepared for use both by college students in social studies methods classes and by in-service teachers in workshops. Each kit is five hours in length and can be used independently or together with the other kits. Some of the exercises in each of the kits have been adapted from the HSGP course. While these exercises were originally intended for use with high school students, they have been tried out successfully with numerous adult groups also. All materials needed, such as aerial photos, maps and diagrams are provided in the kits. Video tapes are also available on loan. The three HSGP teacher education kits developed for 1970 tryout are:

Using Simulation to Involve Students

Using Media to Stimulate Inquiry

Using Evaluation to Improve Instruction

Each kit is based on the assumption that the best way to learn the advantages and disadvantages of any teaching strategy is to experience it. Consequently, the kits provide many opportunities for participation in the use of a variety of educational media, in role-playing simulations, and in evaluation exercises. Such experiences are subsequently analyzed in terms of their educational objectives and their usefulness in a variety of social studies classrooms. At the conclusion of each kit, participants are given an opportunity to apply what they have learned.

The HSGP teacher education materials have been developed with definite participant objectives in mind. Participants completing the HSGP teacher education materials should be both better able to and more likely to:

1. Use open-ended strategies, group work, and a variety of educational media in their teaching

2. Analyze inquiry and simulation exercises in terms of certain characteristics

3. Devise inquiry and simulation activities

4. Evaluate cognitive and affective objectives

5. Discuss the advantages and disadvantages of the open-ended strategies which the HSGP teacher education materials demonstrate

Introduction to Using Simulation to Involve Students

A major feature of the new social studies is student involvement in simulations of real problems and processes. In these classroom experiences, political, economic and historical processes are simplified so that learning about them is enhanced. Moreover, learning takes place as students participate actively. Although many such experiences are based on the "game" principle, with winners and losers, emphasis also can be placed on making choices and playing roles which is the direction followed in this kit. These experiences should be useful for teachers interested in stimulating greater student participation in their classes.

This kit is designed to take five hours and is divided into four parts.

Part I provides direct experience with a role-playing simulation. The simulation deals with the location of a factory and provides a point of reference for each succeeding part of the kit.

In Part II a reading describes the major characteristics of this kind of educational simulation. A discussion relates the points in the reading to the factory location simulation of Part I.

Part III emphasizes the role of the teacher in carrying out simulation exercises. A video tape of

teachers and high school students working through a factory location simulation, similar to the one in Part I, provide the basis for discussion.

Part IV provides occasion to analyze another example of a simulation activity in terms of the major characteristics presented in Part II. Video-taped excerpts of a class working on the new simulation also provide opportunities for participants to reconsider the teaching styles discussed in Part III.

PART I: PARTICIPATING IN A SIMULATION

You are part of the management team of a new metal fabricating company. Although you and each of the members of your team have a specific job, you as a group must make the decision about where to locate your factory. A brief description of each member of your management team is given below.

President - Gregory Williams, age 53, is concerned with all facets of the factory's location and especially concerned with the market area having the best long-run prospects for the company.

Sales Manager - Ralph McNeil, age 45, is concerned with the best sales location for Metfab. Thus, he is interested in present market conditions and the shipping costs of finished products to this market.

Production Manager - Samuel Dubrowski, age 41, is concerned with the production aspects of the company. This includes hiring a productive labor force and minimizing the cost of raw materials.

Personnel Manager - Frank Greenstein, age 37, is concerned with the maintenance of an adequate, but inexpensive, labor force. He is also interested in an area attractive to middle and upper management.

Treasurer - Henrietta Engle, age 48, is concerned with good financial contacts and credit at low interest rates. She also feels low corporate taxes are important.

In addition to your special knowledge, each of you is aware of the general nature of production for the new company. Your factory will be medium-sized with a total employment of about 200 persons. The company will purchase from copper and steel manufacturers and sell to other manufacturers. Your products, steel and copper containers, will be sold to producers of agricultural and industrial chemicals. You are aware that a rather high proportion of the company's employees will have to be skilled workers and that such a labor force is both difficult to find and expensive.

In previous meetings your management team has decided to locate in the United States. To date you have narrowed the list to the following eight cities which all of you agree are most likely to provide an adequate

supply of workers and specialized suppliers.

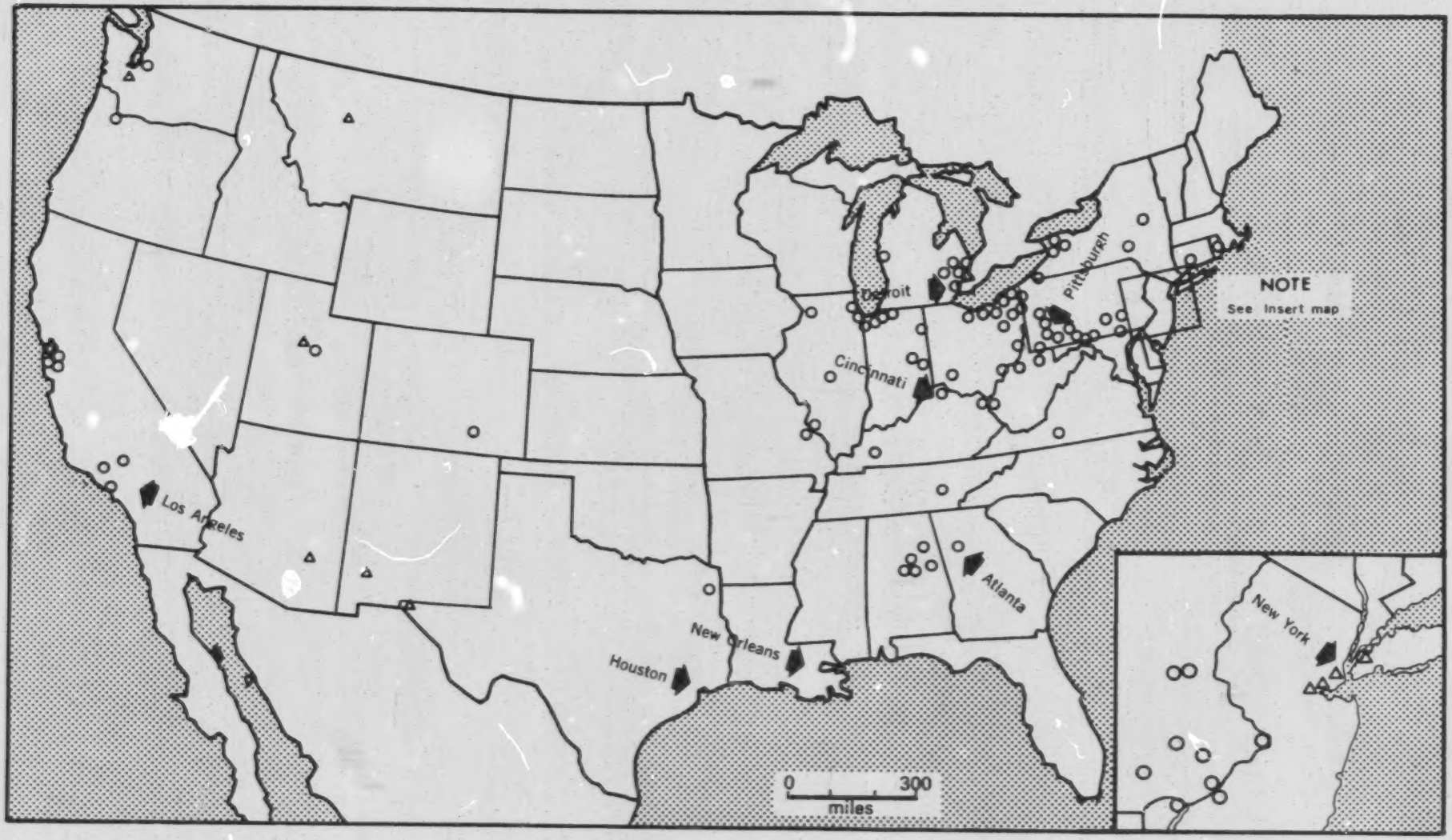
Atlanta	Los Angeles
Cincinnati	New Orleans
Detroit	New York
Houston	Pittsburgh

Each area also will be able to provide the services your operation requires, such as rail and truck transportation facilities, and fire and police protection. These eight cities, as well as copper and steel production locations, are shown on the map on page 7 of this manual.

On the basis of the information provided up to this point, decide among yourselves which role each of you will assume. If there are only four in your group, you can delete any role but the president's. When roles have been decided, each member of the team should take ten or fifteen minutes to read his role carefully. Although the data presented in the roles are not completely accurate, your location choices should not be affected by hypothetical or simplified information.

After reading your role, you select several cities as your location suggestions for the factory. In addition, you should have reasons to support your choices.

As participants you probably will bring to your role information and background that go beyond the limited statement provided in the role description. Feel free to use or share this information as you make your initial choices and subsequently participate in making the group



○ Major Steel-making Locations

△ Copper Refining

◀ Potential Locations for Metfab

decision. At the same time, you should not attempt to redefine your role.

When you begin your management group meeting, your responsibility will be to help choose the best city in which to locate the factory. Each of you has one vote and a unanimous decision is desirable. The president will serve as group chairman for your thirty-minute management group meeting. After your session, you will come together with the other teams to present and support your decision.

President Gregory Williams

You have had a great deal of previous experience while working as a management officer in a competing firm. You are well aware that there are many different factors which must be considered in making a wise choice of location. To ensure the best possible location for your factory, you want all of your management team members to agree on the final choice. Each member, including yourself, has one vote. You may be called upon to support your management decision publicly.

You believe that the firm would be best located at some distance from your competitors, if such a location is otherwise feasible. You think this would tend to ensure a local market, which your competitors would find difficult to steal away from you. To ship products into

the area would cost your competitors more, their service would be slower, and they would not know the territory as well. Conversely, you would be able to serve this local market extremely well and, thus, pick up a larger proportion of its business.

The Market Ratio Table which follows in this Participant's Manual lists the anticipated average tons of your product sold annually in each one of the cities. When this figure is divided by the number of competitors in the area plus your factory, the resulting market ratio indicates the anticipated number of tons you are likely to sell in that market region. For instance, as you see from the table, there are three competitors already located in New York. If you choose to locate in New York, there would be four metal fabricating plants in the area. Thus, the market for the area (1,600 tons) is divided by four to determine that your market ratio would be 400 tons.

Market Ratio Table

Metropolitan Area	Number of Competitors Already There	Tons of Product Sold Annually	Market Ratio
Pittsburgh	0	600	600
Atlanta	1	1,100	550
Houston	1	1,000	500
Cincinnati	2	1,500	500
New York	3	1,600	400
Los Angeles	1	800	400
Detroit	1	600	300
New Orleans	0	300	300

Because of contacts in the industry, you believe that the greatest potential growth in your markets, the basic agricultural and industrial chemical industries, will be in the Gulf States region. Since you are considering the long-range prospects for the company, you think that the Gulf States should be given greater weight than indicated by the present geographic pattern of markets.

In addition, you are favorably influenced about locating in the Gulf States because a number of your relatives, including several grandchildren, live in that region.

Sales Manager, Ralph McNeil

You are in charge of the sales force of the new company. You have great faith in the quality of your products. You are also confident that your crack salesmen can outsell any of the competitors, no matter what location decision is made. However, you believe that the way to build a strong company is to pick out the best spot to supply the majority of your customers, and then outsell the competition. You believe this because the closer you are to the largest number of customers the better chance you have of outselling the competition. The market in each of the eight cities is found on the following table.

Market Table

Metropolitan Area	Tons of Product Sold Annually
New York	1,600
Cincinnati	1,500
Atlanta	1,100
Houston	1,000
Los Angeles	800
Pittsburgh	600
Detroit	600
New Orleans	300

In addition, you believe that an important way to increase profit is to save money in distributing your product. Information about costs of shipping is found in the table, "Total Costs for Shipping the Finished Product to Market Areas." The figure for each city represents the costs of shipping your finished products to the customers.

Total Costs for Shipping the Finished Product to Market Areas

Metropolitan Area	Product Shipping Costs
Houston	$1,500,000
Cincinnati	1,500,000
New York	1,550,000
Pittsburgh	1,600,000
Atlanta	1,650,000
New Orleans	1,800,000
Detroit	1,900,000
Los Angeles	2,900,000

Another consideration for you in making the location decision is good airline connections, so that you can reach a potential customer quickly. Good airline transportation will enable you and your salesmen to spend more time with your families. Airline connections for each city are listed in the next table.

Airline Passengers for Selected Metropolitan Areas

Airports	No. of Passengers Inbound and Outbound
New York	1,089,822
Los Angeles	480,218
Pittsburgh	225,740
Detroit	166,947
Atlanta	145,574
Houston	112,120
Cincinnati	83,857
New Orleans	81,390

Production Manager, Samuel Dubrowski

You are in charge of gathering together the necessary materials, primarily finished steel and copper, for the production of the company's chemical containers. You are also responsible for the production processes in the factory.

Your major concern is with the transportation costs of your two major materials--copper and steel. You have noted that all copper suppliers absorb transportation

costs and sell at a uniform delivered cost regardless of location. Therefore, your main consideration in choosing a site is the availability of steel at a low cost. The total cost of getting the necessary steel from the nearest source of supply for each city is shown on the following table.

Costs of Shipping Raw Materials to Selected Metropolitan Areas

Metropolitan Area	Steel Shipping Costs
Pittsburgh	$ 0
Los Angeles	62,000
New York	120,000
Atlanta	148,000
Detroit	182,000
Cincinnati	188,000
New Orleans	206,000
Houston	300,000

Your other worry is the availability of a hard-working and productive labor supply for the plant. You are well aware that Mr. Greenstein, the Personnel Manager, is most concerned with the wage rates that he must pay for labor. However, you believe his viewpoint is short-sighted. You know from actually running a shop that the most important factor is the productivity of the labor force. A more productive labor force will turn out more finished products in a given amount of time than a

less productive labor force. On the table below, cities are ranked, from highest to lowest according to their labor productivity. You will want to select a city with a high productivity index, if at all possible.

Labor Productivity Index

Metropolitan Area	Productivity Index
New York	7.23
Houston	7.18
Pittsburgh	7.15
Atlanta	6.99
Cincinnati	6.66
New Orleans	6.40
Detroit	6.20
Los Angeles	6.10

You and your chief assistants are in the habit of skiing in New England during the winter. If possible, you would like very much to locate as close as you can to these ski areas.

Personnel Manager, Frank Greenstein

As Personnel Manager you are responsible for assuring an adequate supply of qualified workers available at reasonable cost to operate the factory efficiently. Each metropolitan area is ranked in terms of anticipated labor costs for your two hundred employees.

However, among these cities, you would prefer to locate in one which does not have too "tight" a labor supply. The right kind of skilled labor needs to be available to hire. In a city with a tight labor supply, you would have difficulty finding workers. You know that productivity is important too, but are suspicious of so-called "productivity indexes" that seem to have no clear monetary meaning. The availability of labor for each city is noted on the "Labor Costs and Supply Index" that follows.

Labor Costs and Supply Index

Metropolitan Area	Total Wage Costs	Labor Supply Index*
Atlanta	$1,182,000	B
Houston	1,204,000	C
New York	1,229,000	A
Cincinnati	1,295,000	B
Pittsburgh	1,346,000	B
New Orleans	1,375,000	A
Los Angeles	1,398,000	C
Detroit	1,416,000	B

*A Tight
B Moderately tight
C Moderate surplus

Another major consideration for you is a city's attractiveness to middle and upper management personnel. You are aware that the competition for plant managers is becoming fierce. You know that when such people have a

choice, they tend to prefer warm climates to cold climates. Air pollution makes a city unpleasant to live in, too. The cities are ranked below, from least to most air pollution.

Air Pollution Ranking

1. New Orleans	5. Detroit
2. Atlanta	6. Pittsburgh
3. Houston	7. Los Angeles
4. Cincinnati	8. New York

Treasurer, Henrietta Engle

As Treasurer of the company, you believe that any good decision requires a long, hard look at the profit picture. Furthermore, you believe that although a long-term profit is nice to dream about, a substantial profit in the short-term is absolutely necessary. You will be most impressed with cities which promise the greatest immediate profit for Metfab.

In order to increase the new company's chances for short-term profit gains, you propose locating in a city with low corporate taxes. The annual average corporate taxes in each city are shown on the following table.

Corporate Taxes for Various Cities

Metropolitan Area	Corporate Taxes
Cincinnati	$100,000
Houston	110,000
Atlanta	120,000
Pittsburgh	130,000
Los Angeles	150,000
New Orleans	175,000
Detroit	195,000
New York	200,000

You are also aware of the advantages of having good contacts in the banking world. The ability to obtain future financing, if needed, and the ability to invest profitably are enhanced by close contact with the banking interests. Bank deposits are indicated on the table that follows.

Bank Deposits for Various Cities

Metropolitan Area	Total Bank Deposits
New York	$51,829,321
Los Angeles	9,130,527
Atlanta	4,915,659
Houston	3,829,317
Pittsburgh	3,756,934
Cincinnati	1,357,332
Detroit	1,325,435
New Orleans	1,091,174

One immediate financial consideration is the interest rate prevailing in each city. Your company will have to borrow about $2,000,000 for factory construction and equipment. Interest rates are known to be higher in the West than the East by as much as two per cent.

PART II: ANALYZING A SIMULATION

The experience you have just had probably indicated that a variety of objectives can be achieved by educational simulations. Among the kinds of learnings high school students might be expected to achieve are to: 1) increase their understanding of important generalizations; 2) improve their decision making skills; 3) develop their ability to work effectively in groups, and 4) develop more positive attitudes.

A cognitive objective served by educational simulations is increased understanding of important generalizations. Many of these generalizations are about factors related to the problem under consideration. For example, costs and market conditions influence factory location decisions. Understanding is increased because such knowledge of various factors is used in a practical situation where alternative choices are weighed and assessed in terms of the factors considered important to the problem.

Improvement of decision making skills is possible

through simulations because opportunities are provided to practice decision making and justify the decision reached. Such skills are undoubtedly complicated and to some extent unique to each individual. Analytical and logical skills are surely involved. But included also is increased tolerance for complexity. One example of such tolerance is a willingness to consider several alternatives before making a final choice. Another dimension is a tendency to examine each alternative in terms of several relevant factors.

Ability to work in a group also is likely to improve with opportunities to practice and simulation exercises offer opportunities for group interaction. Students may learn that convincing others is as important as arriving at a sound conclusion. At the same time, they are likely to gain respect for the opinions of others as alternative conclusions are convincingly defended. They also learn the value of keeping the group on the subject and of summarizing the "consensus of the group" at appropriate times.

The high degree of student involvement during simulation activities tends to develop positive attitudes toward school experiences. Teachers generally consider interested students a fortunate by-product of teaching. Yet a good case can be made that the development of

positive student attitudes should be a conscious educational objective. As students come to make more and more of their own decisions, what they think about their school experiences is likely to become crucial in making future educational choices.

Simulation exercises appear to have considerable potential for the achievement of a wide range of educational objectives. At this point, some of the characteristics of simulations should be identified. Teachers might then be better able to incorporate simulations in their teaching strategies.

There are a number of ways of looking at an educational simulation. In the approach used here three characteristics are identified: first, the existence of a problem and several plausible solutions to it; second, the factors that have an influence on the decision; third, the use of roles to present information about the problem to students. Each of these three characteristics will be discussed in turn. However, the development of an educational simulation does not always follow an orderly pattern. The actual process of development is likely to involve a consideration of one and then another of these characteristics.

The Problem and Plausible Solutions

Educational simulations usually contain a problem or issue that requires a decision. The problem might be of immediate concern to the students involved, such as cheating on tests, using drugs, or planning a class trip. Simulations can also be based on problems of direct interest to political scientists, historians and geographers.

The success of a simulation depends not so much on the subject matter involved as it does on either the use of student competition or on the use of student disagreement as motivation. Student competition is the force behind many simulation "games," which often involve exchanges of money or items so that some students come out ahead of the others--"winning" or "losing."

The type of educational simulation discussed here relies on the development of student disagreement for motivation. Without disagreement about the choices they make, students will have little reason to defend them. Because students have to defend different choices, reasons for interaction and discussion exist. In fact, a simulation exercise of this type is self-generating because students groups can function effectively with minimal teacher intervention.

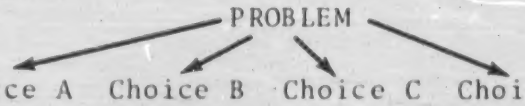
A crucial aspect of any simulation problem is the variety of choices that are available for the decision

makers. People face many problems where there are no clearly defined alternatives from which to make a choice. In fact, most significant problems are sufficiently complex that the alternatives are not readily identifiable. Deciding what to do about inflation or how to spend one's limited income are problems of this sort where clear cut choices sometimes never emerge. As a result, lack of time may force a choice when the individuals involved are still not clear about the available alternatives. Even such a problem as deciding on an occupation may seem unmanageable at first. Only when the number of occupations is reduced to a relatively few possibilities can an individual proceed to make a decision.

Thus, in considering the problem on which an educational simulation focuses, you must determine whether several distinct choices are available to the participants, or whether a less defined choice situation exists. The question is whether the simulation has a simplified problem situation with clearly defined choices, or whether students are exposed to the complexities of distinguishing and clarifying the choices that seem to be available. A simulation is probably less complex for the students when clear-cut alternative solutions to the problem are indicated.

One important characteristic of a simulation, then, is a clearly defined problem, including the choices available

to the decision makers. Diagramatically this can be shown as follows:



The discussion of this first characteristic of simulations will focus on the following questions. They relate to the factory location exercise you completed in Part I.

1. How would you formulate the problem or issue you were asked to decide upon? Did the developer of this simulation simplify the choices? If so, how did he do it?

The Factors Influencing a Decision

A second major characteristic of educational simulations is the factors having an influence on the decision. These are the variables likely to be relevant in the making of a decision. When an individual has to make a choice of an occupation, for example, his capabilities would be relevant variables for him to consider. Other factors that might bear upon such a decision include expected income and the number of available jobs in each occupation. In order to make a decision from among several alternative occupations, an individual should weigh each occupation in terms of the things he

thinks are important to consider. Objective information can be obtained about the capabilities required, the income expected and the availability of jobs for each occupation.

Influencing almost every such decision are personal factors that vary from individual to individual, such as interests or inclinations. The likes and dislikes of an individual will affect his occupational decision as much or more than any of the more objective factors indicated above. For example, a man who does not like to work with his hands is not likely to become a dentist. Decisions are made by people who interpret alternative choices in terms of their effects on personal interests.

Moreover, the influence of personal perspective often goes beyond the expression of different individual interests. One person is likely to consider certain of the apparently objective factors influencing a decision to be more important than other objective factors. For example, one person making an occupational choice will be influenced more by salary prospects, while another person will be influenced more by job prospects and job security. In another context, without the influence of a personal interest, some individuals making business decisions might consider market variables to be more important than cost variables, for example. Their decisions reflect

this tendency to give different weights to different decision factors.

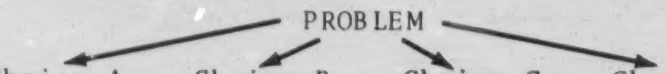
Thus, in decision-making simulations, subjective influences are included along with the more objective variables that reflect important generalizations relevant to the problem. However, all the objective and subjective influences on a decision cannot be included in a simulation exercise. A simulation is a simplified representation of reality. The objective and subjective factors selected to remain in the simplified process or problem should contribute to the educational objectives of the simulation.

In examining a simulation exercise, problems sometimes arise about the accuracy of the information used. Data about some of the variables influencing the decision may be somewhat incorrect. Sometimes correct data indicate that one choice is superior to all others. In this case, the decision maker would have little difficulty in making his choice. More important, in group decision making, there would be little likelihood of disagreement among members of the group. In such a group decision-making situation, the use of correct data conflicts with the need for disagreement as the motivational element.

Working with incorrect data is not easy for teachers to do. However, when the educational objectives of a simulation exercise are kept in mind, knowledge of accurate

information is not as important as understanding the factors influencing the decision. Therefore, if the success of a simulation exercise depends upon data revision, the teacher must be willing to use inaccurate data or to adapt his data. However, data modification should be kept within reason; otherwise, the total plausibility of the simulation will become doubtful. When data are modified, the students should be informed that the data are not completely correct.

In summarizing this characteristic of a simulation, several objective and subjective factors to be considered in making a decision need to be clearly identified. These factors indicate the data that are relevant to each of the possible choices. Thus, the simulation characteristics diagram can be extended as follows.



	Choice A	Choice B	Choice C	Choice D
Factor 1	data	data	data	data
Factor 2	data	data	data	data
Factor 3	data	data	data	data
Factor 4	data	data	data	data
Factor 5	data	data	data	data

2. In the factory location simulation exercise with which you have worked what factors were selected as

influences on the location decision? Which of these factors would you classify as objective and which would you classify as subjective?

Role-Playing

A third characteristic of educational simulations is the way in which information about the problem and the variables is presented. In many simulation exercises roles are used to perform this function. Since roles are carried out in a group context, the kind of group to make the decision should be described. If the problem is deciding what should be produced on a farm, choices may be made by members of the farm family. If the problem is deciding what to do about inflation, the choice makers may be presidential advisors or persons representing particular economic interests, such as labor, business and the aged.

The kind of educational simulation discussed here has two places where students make choices. The first place is where the individual working with a role makes his own decision, based on the objective and subjective factors built into his role. Data about these variables is made available for each of the relevant choices. Probably then different students, in assuming the same role, will reach different conclusions about the problem.

The second place requiring a choice is where the group makes its decision. In addition to the role-directed influences on each student, a number of other variables enter into the group decision. For example, the personalities of individual students come to make significant differences in the choices made. Some students are more persuasive than others and some are reluctant to express themselves at all. As a result, one group is likely to reach a different decision than another group even though the individuals playing each role may have started with the same choices in mind.

Of course, roles do not have to be prepared at all, but instead all the participants could be provided with information about all objective factors that may be involved in making a choice. Then reliance would be placed on existing biases and perspectives of students to generate disagreement about the best solution to the problem. In such a simulation, the making of the decision is far more complex because the individual is given all relevant variables to consider at once. Using the device of roles, the student learns on his own about some of the variables and then learns about other variables from members of his group.

The completed diagram for an educational simulation follows. The diagram shows how a role, such as X, can

be planned to incorporate a limited number of factors that influence the choice to be made. Data provided about each of the factors have positive, negative, or neutral implications for each choice. For example, the president was assigned a role which contained these objective factors: anticipated share of the market (Factor 1); long range market prospects (Factor 2); and family personal preference (Factor 3). In terms of anticipated share of the market, the data about Pittsburgh were positive, Atlanta positive, New York neutral, and New Orleans negative. In terms of family preference, New Orleans was positive, New York negative, Atlanta neutral and Houston positive.

PROBLEM

		Choice A	Choice B	Choice C	Choice D
Role X	Factor 1	positive	positive	neutral	negative
	Factor 2	negative	neutral	positive	positive
	Factor 3	positive	negative	neutral	positive
Role Y	Factor 4	positive	positive	neutral	negative
	Factor 5	negative	neutral	positive	positive
	Factor 6	negative	positive	positive	neutral
Role Z	Factor 7	negative	neutral	positive	positive
	Factor 8	negative	positive	positive	neutral
	Factor 9	positive	negative	negative	neutral

3. For the factory location simulation exercise you have completed, identify some of the factors assigned to each role other than the president.

PART III: CLARIFYING THE ROLE OF THE TEACHER

In this part you will view a video tape of two classes of high school students participating in a factory location simulation called "Locating the Metfab Company." (The classroom activity is contained in the High School Geography Project's unit on Manufacturing and Agriculture published by The Macmillan Company). The simulation is similar to, but more complex than, the factory location simulation you worked with in Part I of this kit. The video tape excerpts were taken from six class periods of teaching by each teacher. Summaries of the parts of video tape can be found on page 33 to 40 of this Manual. The summaries may be useful later in reviewing the series of developments in each class.

The video tape is divided into three segments: "Introduction," "Group Work" and "Summary." In the "Introduction" each teacher lays a foundation for the subsequent work on the simulation. In "Group Work" attention is focused on small group discussions and on the role of the teacher in working with the small groups and individual students. In the "Summary" attention is given to reports of students about the results of their group work. First, you will be shown one class going through the "Introduction," "Group Work" and "Summary" phases, and then you will see the second class going through

the same three phases. You will view about ten to thirteen minutes of video tape for each of the classes.

When viewing the video tapes, you will want to take brief notes on the behavior of the teacher and the students. These notes will provide a basis for the class discussion that follows. After each of the three phases, your instructor will stop the video tape for a minute or two so you can write down your impressions, subjective as well as objective.

You will have your own way of describing the behavior of each teacher, for example, in physical terms such as standing still or moving around the room. Another way could be the speed and tone of her voice. Sometimes a teacher talks in an explanatory-descriptive way. At other times, the teacher asks questions and responds to the questions of students. Some of these questions call for a specific answer and others are more open. Sometimes each teacher focuses on the whole class and at other times on a small group of students or a single student.

You will also have your own way of describing the behavior of the students in each class. Sometimes their behavior is passive, acquiescent behavior, and at other times it is active physically and orally. Another way of looking at student behavior is in terms of evidence

suggesting attentiveness and a sense of direction. Other evidence may suggest inattentiveness and lack of focus on the learning task. Still other behavior may imply certain positive and negative attitudes of students toward one another and the teacher.

You will be making two kinds of comparisons. One comparison is the changing roles of the teacher and the students during the introductory, group work and summarizing phases of the simulation. Clearly, there are differences between one phase and the next that you should note. A second kind of comparison is between the two teachers shown on the video tape. They have differences as well as similarities in teaching style that you will want to describe.

After the tape of both classes has been shown, your instructor will conduct a class discussion. You and he may wish to consider a number of other questions and comments. However, the following topics warrant discussion.

1. What similarities and differences did you note in the way the two teachers handle the introduction, group work, and summary phases of the simulation? During which phase did you note the greatest difference between the two teachers?

2. What differences, if any, did you note in the

way roles were assigned to the students?

3. What differences, if any, did you note in the way the two teachers ask questions? Also, in the way they handle student questions or comments?

4. Did either teacher attempt to summarize the learnings of the simulation exercise? Do you think it is desirable to do so? Why?

5. Identify one of the teachers and indicate some things you would have done differently during the three phases of the simulation.

6. Which of the three phases probably would be easiest and which probably most difficult for you to teach? Why?

7. What appear to be some of the major advantages and disadvantages of simulation exercises?

Video Tape Summary: A Factory Location Simulation - Part I

This thirteen minute video tape shows a ninth grade civics class participating in "Locating the Metfab Company." The exercise is very similar to the factory location simulation in which you participated. You will note that the factory location simulation in which you participated has been modified in order to save time. The high school classroom version of this simulation is designed to take six class periods but the video tape has been edited to thirteen minutes. The difference

in time results from the fact that students must select their location from among twenty-five cities, rather than from only eight cities. The class, a heterogeneous group with a wide range of ability and intelligence, took all six days to complete the simulation. This is the first time the teacher, Mrs. Kay Ingleman, taught"Metfab." The portions of the tape were selected to show the role Mrs. Ingleman plays in the simulation and the general classroom atmosphere that results from her method of teaching a simulation.

The video tape is in three segments or scenes, marked by a brief fade. The scenes coincide with the three basic sections of the simulation: "Introduction," "Group Work" and "Summary."

Introduction

In this two minute segment the teacher tells the class they will be playing a simulation game, and will be role-playing. In other words, they will not be students, but rather presidents, sales managers and other members of a company's management team. Mrs. Ingleman explains that she will play the role of research assistant to be available to answer questions. The class will be concerned mainly with locating a hypothetical company called Metfab. The teacher explains that although the

data are not as complex as they would be for a real company, the class will get a good idea of what a company would have to do in order to select a city in which to locate.

Group Work

This scene begins as Mrs. Ingleman explains to a president that her job is to keep the group working. The teacher notes that the president does not seem happy with her role. However, since none of the other members of the group want to assume the role of president, the teacher tells the student she was chosen because she could do a good job.

Mrs. Ingleman then calls all the personnel managers to the front of the room, to tell them that their job does not seem so hard. She clarifies the term "tight" labor and tells the students that they do not have to multiply any of the data. She explains that they must rank the cities from highest to lowest on both of their charts. She explains that Atlanta probably is not a good choice. A girl, in the role of treasurer, checks her decisions with the teacher, who then clarifies the term, "total bank deposits." Then she and the teacher discuss Buffalo in terms of total bank deposits.

Next, a group of boys discuss the possibility of agreeing on a city. The teacher urges one boy to be less "wishy-washy," and tells them to check their data. The group then discusses Pittsburgh in terms of shipping costs and labor costs. Another group member suggests the consideration of Minneapolis.

Summary

In this three minute scene, the teacher says she will give the groups ten minutes to do any last minute figuring and then the presidents will give their reports. The first president reads his report. His group chose Buffalo because it has a very good competition ratio. When he concludes the report, Mrs. Ingleman asks the class if there are any reasons why they are not convinced to locate Metfab in Buffalo. A class member says that Buffalo is a bad choice in terms of bank deposits, corporate taxes, and total wage costs. The teacher and the president disagree about the taxes being high. The transparency of corporate taxes is shown and discussed. The class member then reiterates his point that Buffalo's labor costs are high. When the teacher

questions the class about why all the cities have high labor costs, the class determines that the high costs result from the use of skilled labor.

Video Tape Summary: A Factory Location Simulation - Part II

This ten minute video tape depicts a tenth grade geography class participating in "Locating the Metfab Company." This class also took all six days to complete the simulation. As in the previous part of the video tape, the portions were selected to portray the role this teacher, Sister M. Hermana, plays in the simulation and the general classroom atmosphere that results from her method of teaching a simulation. She has taught "Locating the Metfab Company" several times. The class is composed of a group of girls with above average verbal aptitude.

This part of the video tape is in three parts or scenes, and the end of each scene is marked by a brief

fade. The scenes coincide with the three basic sections of the simulation: "Introduction," "Group Work" and "Summary."

Introduction

In this two minute segment, the teacher begins her introduction by telling the class they will be spending the next class periods as management teams of the Metfab Company, a metallic fabricating company that makes machinery for basic and agricultural chemical companies. As the management team of Metfab, the students will have to make a decision about which of the twenty-five largest cities in the United States would make the best location for the company.

When they select their roles, Sister Hermana suggests that the students select a role that fits their personality. For example, if a student is skillful at convincing people and selling things, she should select the role of sales manager. The teacher then tells the girls to read the roles so that each management team can decide who is to assume each role.

Group Work

This three minute scene opens with a group discussing Chicago in terms of potential market and availability of

raw materials. Next Sister Hermana helps a girl in the role of president who is reluctant to assume one of the viewpoints written into her role. Another group of girls discusses various cities in terms of potential market. The teacher then agrees with a suggestion from a student that each member of the management team should select only their top three cities. Sister Hermana then moves to another group to clarify the term "tight" labor. This scene concludes with a group of girls discussing the possibility of locating Metfab in Philadelphia or Chicago.

Summary

In this four minute scene, the teacher begins by saying the presidents will present and defend their choices. The class is encouraged to question any of the presidents regarding reasons for their location decision. The first president says that her group chose Pittsburgh because, among various reasons, the city has a good supply of skilled laborers. A class member then questions the first president about Pittsburgh and states that Cincinnati has a much better potential market. Then the second president gives her report. Her group chose Cincinnati because it has a good potential market and low production costs. Another girl in the group helps the

president defend Cincinnati as the location choice.

Sister Hermana then asks the whole class to give some general conclusions they can draw after having examined data about the Metfab Company and having exchanged opinions about the data. One member says that when a company wants to locate a factory, there is more than one choice that can be made. Another girl says that a factory location decision is an involved and tough decision. The teacher says that both of these generalizations are very good. Sister Hermana concludes by stating that, when a decision is to be made, examining data is better than making a random choice.

PART IV: APPLYING A SIMULATION MODEL

In this part of the kit, you will view a video tape of a class of high school students participating in a land use location simulation called "Portsville." (This classroom activity is contained in the High School Geography Project's unit on Geography of Cities published by The Macmillan Company.) The activity is different from the factory location simulation with which you have been working. An obvious difference is the fact that students build a hypothetical city as they imagine it might have developed.

As background for the video tape you should read the

synopsis of the Portsville activity provided on pages 43 to 46 of this Manual. A summary of the video tape, which is Part III, is found on pages 46 to 49. This video tape summary may be useful later in reviewing the series of developments shown on the tape.

The sixteen minutes of video tape you will view are the edited result of about two weeks of teaching. Like the previous parts, this portion of the tape is divided into "Introduction," "Group Work" and "Summary." As noted earlier, "Introduction" lays a foundation for the subsequent work on the simulation. In "Group Work" attention is directed to small group discussions and to the role of the teacher, Mr. Phil Cognetta, in working with the small groups and individual students. In "Summary" major attention is given to reports of students about the results of their group work.

The class, a ninth grade civics class, has only about fifteen students and has more girls than boys. The students represent a wide range of ability.

When viewing the video tape, you will want to take brief notes which will provide a basis for the class discussion that follows. After each of the three phases, your instructor will stop the video tape for a minute or two so you can write down your subjective and objective impressions.

The class discussion that follows the viewing of the video tape will focus on three different topics. One is the instructional process in this classroom. As with the earlier video tape sequences, the behavior of teacher and students is important, especially how the teacher asks questions and interacts with students.

A second discussion topic will be the things that students seem to be learning during the simulation exercise. For this discussion you may want to view the video tape again after reading the questions that are provided in this Manual for discussion.

A third discussion topic will be the ways that the Portsville simulation exercise differs from the factory location simulation. A series of questions is provided here to identify the characteristics of the Portsville simulation that distinguish it from the Metfab simulation.

1. How would you describe the instructional process in this particular classroom with respect to:
    a) the role of the teacher, especially in questioning students in interacting with them?
    b) student participation?
    c) the attitudes of students toward the teacher and to one another?
2. What do students seem to be learning in this

simulation with respect to:

a) concepts and/or generalizations?

b) intellectual abilities or skills?

c) attitudes about school experiences?

d) attitudes about themselves and fellow students?

3. In what ways is "Portsville" similar to and different from the factory location simulation with respect to:

a) the problem requiring decision?

b) the use of clearly designated choices?

c) the factors that seem to influence student decisions?

d) the use of roles

e) the way that information is provided for students?

Synopsis of "Portsville"

"Portsville," which requires about two weeks of class time, focuses on student work with a Modulex board and colored plastic pieces that are attached to the board. This board represents the site of a hypothetical West Coast city in 1850 and the tiny pieces represent various kinds of land use. Four boards are used in a class so that each group of students builds its own city, using the Lego blocks to indicate their land use decisions.

The first part of the activity is teacher oriented. The teacher first leads an inquiry discussion to clarify site characteristics and then estimates where the city would have been most likely to start. Perspective is provided for students by a historical reading that describes the time of the first settlement.

The second part of the activity covers the time period from 1850 to 1880. The primary responsibility of the student groups is to build Portsville as they believe it existed in 1880. Before the building actually begins, the students must read parts of the narrative covering the events of the period. A discussion brings out the salient points of the narrative. Then the teacher has to explain the land uses and the meaning of different colored Lego building pieces. Each building piece of a given color refers to a certain kind of land use. For example, yellow pieces designate manufacturing; white pieces, public buildings; and buff pieces, single family residential buildings. At this time, students and teacher can raise and answer questions about working in groups and constructing a city.

Given a limited number of Lego blocks and guided by the narrative, the student groups build Portsville as they believe it existed in 1880. The teacher functions primarily as an observer, with an occasional "why"

question interjected into the group discussions. After all the groups have completed their construction, a class discussion is begun to compare and evaluate the construction work of the several Portsvilles. Questions such as the following are raised: "What are your reasons for putting the manufacturing plants where you did?" "What reasons can you give for the location of multiple unit dwellings?" "How did the Portsville habitat influence the pattern of land use?"

The next part of the activity covers the period from 1880 to 1890. Again, students read a narrative about Portsville's history during this period and build Portsville as they imagine it existed in 1890. A class discussion with all boards in view of the class follows. Some questions bring out reasons for land use locations. One of these questions is, "What factors influenced the locations of high income residences?" Another type of question focuses on land use patterns. Such questions include, "In what ways did the addition of the railroad influence land use change?" Another is, "What residential land use patterns are evident?"

The fourth part of the activity covers the period 1890 to 1900. This part of the activity also has a reading, a period for construction work, and a time for evaluating the construction work. Teachers are

urged to maintain a flexible attitude in class so that students do not judge the solutions of others to be wrong simply because they are different from their own solutions. Teachers are advised that solutions should be accepted if students can justify their decisions.

An optional fifth part of the activity, dealing with Portsville after 1900, is largely a teacher led discussion to satisfy student curiosity about how Portsville continued to grow. If students have not already guessed, they are told in this part that Portsville is, in reality, Seattle, Washington.

Video Tape Summary: Land Use Location Simulation - Part III

This sixteen minute video tape depicts a ninth grade civics class participating in one of the High School Geography Project's activities, "Portsville." This exercise included in The Macmillan Company's Geography in an Urban Age course, is designed to take about ten class periods. The segment of video tape you will see does not include entire portions of any parts of the activity. However, the edited selections portray the role this teacher, Mr. Phil Cognetta, plays in the simulation and the general atmosphere that results from his method of teaching a simulation. The class of about fifteen students met during the last period of the day and is a heterogeneous

group exhibiting a wide range of ability. As before the video tape is in three parts or scenes and the end of each scene is marked by a brief fade. The scenes coincide with the three sections of a simulation: "Introduction," "Group Work" and "Summary."

Introduction

Mr. Cognetta begins this short scene by telling the class they will be building an imaginary city called Portsville on a Modulex board. The teacher then displays the board and briefly describes some of the topography it depicts. After telling the class they will be working in groups, he asks them to turn in a paper with the names of the students with whom they would least and most like to work.

Mr. Cognetta tells the students their task is to recreate Portsville the way they think it existed. He tells them to keep in mind why they are placing different land use blocks in different locations on the board. He then starts the class by telling all the groups where to put the sawmill. He passes out the materials and admonishes the class not to lose any of the parts.

Group Work

This seven minute scene opens with group interaction

and discussion of the definition of commercial land use. The group decides to put a hotel on the board. Mr. Cognetta joins the group and clarifies the differences between commercial and public land use. He comments that the members of the group must take turns in making choices. A new group is shown discussing where to place various blocks. The teacher then asks another group why they placed a block on top of a mountain and questions the group about available transportation.

Then a group of students is shown discussing where they will place certain land uses on their board. Mr. Cognetta asks the group how far apart their buildings are. When the group answers, "seven blocks," Mr. Cognetta questions their decision. However, he concludes by telling them to do what they want. Next, the same group is shown trying to establish just why their multiple unit dwellings were placed so far from town.

Summary

In this scene the teacher opens by saying that this is the day the various groups will have to defend where they placed their types of land uses. The discussion begins with the class as a whole responding in an amused way to one of the boards. The group is asked to defend the placement of their blocks.

Another group is asked by Mr. Cognetta to defend their placement of high income residential areas together on top of a hill. He also asks the rest of the class to keep in mind the reasons why they may have placed their high income residential areas in different places. A girl in the group being questioned says she thinks people living in high income housing would like to be away from everybody. She further states that transportation will not be a problem because these people can afford lots of horses. Mr. Cognetta then asks how long a walk it would be to town. Other reasons given for their placement of high income residential blocks are that the people would have a good view, and would be away from the dirt and smog of the city. A second group placed their high income residential blocks close to the center of town. They felt these people would enjoy accessibility to the university and the stores.

ANNOTATED BIBLIOGRAPHY

Boocock, Sarane S. and E. O. Schild, editors, Simulation Games in Learning, California: Sage Publications, Inc., 1968

This useful and comprehensive book includes articles on a variety of simulation topics. The authors include Sarane Boocock and Clark C. Abt, as well as many others well-known for their work with simulations. The various aspects of simulation as a teaching device are discussed. The rationale behind the technique, as well as some evidence about the effects of simulation in the classroom, are presented. This volume includes excellent information for those interested in teaching simulation in the classroom.

Klietsch, Ronald G., An Introduction to Learning Games and Instructional Simulations, Instructional Simulations and Company, 1969

This text discusses systems factors and concepts as the basis of simulations and learning games. A simulation model based on the systems approach is included. This volume would be useful for those interested in the details of the systems approach to designing a simulation.

Shaftel, Fannie R. and George Shaftel, Role-Playing for Social Values: Decision-Making in the Social Studies, New Jersey: Prentice-Hall, Inc., 1967.

This comprehensive study emphasizes the use of role-playing to explore group behavior and to help the student as he searches for his personal values. The various aspects of role-playing are discussed in detail. Also, groups of stories relating to value oriented issues are presented. The students role-play within the framework of the simulated experiences and make decisions. The students then analyze their decisions to determine their values.

"Simulation Games for the Social Studies Classroom," New Dimensions, Volume One, No. 1, New York: Foreign Policy Association, 1968. 56 pages.

This pamphlet explains some basic ideas about what simulations are, how to design simulations, and how to teach simulations in the classroom. The values and limitations of simulations and games are discussed. Also, descriptions of some representative classroom simulations, as well as where they might be obtained, are listed in this pamphlet, a very useful reference for teachers.

"Simulations in Education and Training," Educational Technology, Volume IX, Number 10, October, 1969. pp. 43-70.

This issue of Educational Technology includes a section entitled, "Simulation in Education and Training." The articles in this section are about various aspects of simulations including computer simulations, designing simulations, and the effects of simulation training on student teaching behavior. These articles should be of use to those interested in the current work being done in the field of educational simulations.

Other Simulations Included in the High School Geography Project's Geography in an Urban Age course

Intended Grade Level: High School

Number of Players: Approximately 30

Source: The Macmillan Company
School Division
866 Third Avenue
New York, N. Y. 10022

These simulations are available only as a part of a unit unless otherwise indicated.

"The Game of Farming" from Unit 2, Manufacturing and Agriculture.

Time Required: 4-6 Class Periods

Students simulate farmers in western Kansas

during three time periods and learn that farmers' decisions are affected by chance, natural, and economic factors. Since students compete in making successful farming decisions, this is clearly a "game" type of simulation. "The Game of Farming" is sold separately.'

"Section" from Unit 4, Political Geography.

Time Required: 5-8 Class Periods

Students play the roles of state representatives, members of an executive committee, and citizens of a hypothetical state to make decisions about the allocation of the state's budget. The problem of how to allocate the funds for needed projects in various sections of the state makes interaction and compromise necessary. Students are immediately involved in political processes. Although more complicated, this simulation follows the factory location simulation model closely.

"Point Roberts" from Unit 4, Political Geography.

Time Required: 6 Class Periods

Students play the roles of members of various commissions and private citizens to resolve an international boundary dispute. The students see how problems arise out of historical events and learn to work with alternative solutions. The place, Point Roberts, Washington, is real, but many other elements of the activity are hypothetical.

"Rutile and the Beach" from Unit 5, Habitat and Resources.

Time Required: 5-6 Class Periods

Students play roles as representatives of mining interests and various conservation groups to determine how a section of beach land in eastern Australia will be used. The place and problem are real, although some of the data are hypothetical.